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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/665,908	09/18/2003	Demetrius Sarigiannis	108298722US	7052

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EXAMINER

STOUFFER, KELLY M

ART UNIT	PAPER NUMBER
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1762

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	12/27/2006	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/665,908

Applicant(s)

SARIGIANNIS ET AL.

Examiner

Kelly Stouffer

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 November 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 18-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 36-39 is/are allowed.
- 6) ☒ Claim(s) 18-25, 27-34 and 40 is/are rejected.
- 7) ☒ Claim(s) 26 and 35 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 November 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 12/1/06.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, filed 22 November 2006, with respect to the objections of the drawings and specification have been fully considered and are persuasive. The objections of the drawings and specification have been withdrawn.
2. Applicant's arguments with respect to claims 18-35 have been considered but are moot in view of the new ground(s) of rejection.

Drawings

3. The drawings were received on 22 November 2006. These drawings are acceptable.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 18, 21-25, 28, 30-31, 33, and 34 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent Application publication US 2002/0042205 to McMillin et

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al. which includes by reference in its entirety US Patent 6245192 (Application 09/343690) to Dhindsa et al. in paragraph 0037.

Regarding claim 18, McMillin et al. discloses a method for depositing a material onto a microfeature workpiece in a reaction chamber (semiconductor processing in a CVD chamber in paragraphs 0007-0008) by flowing a first pulse of gas through a first gas conduit, before the gas feed lines 50 and 52 meet in Figure 7B, and a first valve 44 in Fig 7B and through a second gas conduit (the showerhead of Dhindsa et al. described in paragraph 0037 of McMillan et al. and shown in the Figures of Dhindsa et al.) downstream from the first valve and into the reaction chamber 10 in McMillin et al. Fig 7B. McMillin et al. shows flowing a second pulse of the first gas through the first gas conduit and a second valve 36 in Figure 7B that flows into the reaction chamber 10 through the second conduit as shown in the Figures of Dhindsa et al. without flowing the second pulse of the first gas through the first valve. The flow splitting of the two pulses is described in paragraphs 0009 and 0037.

With regard to claims 21 and 22, flowing the pulses at least partially simultaneously through controlled valves dispensing the pulses is described in paragraphs 0009 and 0037. McMillin et al. meets all the recitations of claims 21 and 22, at least as broadly recited by claims 21 and 22.

In claims 23-25 the applicant requires the two gas lines to be configured in parallel and comprised of a valve assembly and separate gas passageways for each pulse of the gas to flow through. In Figure 7B, McMillin et al. shows two gas feed lines 50 and 52 that are separate passageways into a showerhead that flows into reaction

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chamber 10. The feedback controlled throttling valves 44 and 36 comprise their own valve assembly, at least as broadly described by the applicant. McMillin et al. meets all the recitations of claims 23-25, at least as broadly recited by claims 23-25.

With regard to claims 28, 30-31, 33-34, and 40 McMillin et al. describes a method for coating a semiconductor substrate in a reaction chamber in paragraphs 0007-0009. McMillan et al. shows a gas injection arrangement where one gas flows through two independent gas lines configured in a parallel arrangement: gas feed lines 50 and 52 with feedback controlled throttling valves 44 and 36 that may each contain a valve stem and comprise their own valve assembly in fluid communication with a common conduit and flow into reaction chamber 10 in Figure 7B and described in paragraph 0037. The flow splitting of the two pulses is described in paragraphs 0009 and 0037. The valves 44 and 36 are adjusted in paragraph 0009. The first and second portions of a gas distributor as required by claim 33 are shown in the Figures of Dhindsa et al. and may be considered a second conduit as discussed above in reference to claim 18. Thus McMillin et al. meets all the recitations of claims 28, 30-31, 33-34, and 40, at least as broadly recited by claims 28, 30-31, 33-34, and 40.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 19-20, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over McMillin et al. McMillin et al. is described above and includes a single gas source entering a reaction chamber with two separate gas lines and corresponding valves. McMillin et al. does not include the sequence of these two pulses. McMillin et al. teaches that the flow splitting of the two gas lines can be adjusted by the user with the mass flow controllers from 0-100% in either line in paragraph 0030 and that the sequence is adjusted depending on the flow desired in the showerhead of Dhindsa et al.

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(Dhindsa et al. abstract) In paragraphs 0032-0033 of McMillin et al. the mass flow controller of the valves is controlled depending on a calibration experiment and the types of gases being flowed into the chamber. Therefore, the variables of flow splitting and sequence depend upon the apparatus and conditions employed in the invention and their importance is based upon the type and uniformity of the coated layer created by the procedure as implied by McMillin et al in columns paragraphs 0030-0033. The variables are result-effective and are not inventive.

It would have been obvious to one of ordinary skill in the art at the time of invention to modify McMillin et al by routine experimentation to include a first pulse of gas followed by second pulse of the same gas as required by the applicant in order to fabricate a layer with desired properties, especially absent evidence showing a criticality for the claimed sequence. (See *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955))

6. Claims 27 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over McMillin et al. in view of US Patent number 6905547 to Londergan et al. McMillin et al. is described above and includes a single gas source entering a reaction chamber with two separate gas lines and corresponding valves. McMillin et al. does not include a second gas source with two separate gas lines and corresponding valves. Londergan et al. teaches two different gases in gas switching manifold 20 that each include a multiple inject port 38 (that may contain a plurality of conduits as described in column 8 lines 31-32) with flow restrictors 1-4 that may be considered valves in Figure 5 B.

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Different gases have separate gas injecting apparatuses to introduce a second reactive gas into the chamber reduce cross-contamination between the first and second gases (column 8 lines 6-10).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify McMillin et al. to include more than one gas with a separate gas injection apparatus as taught by Londergan et al. in order to introduce a second reactive gas into the chamber reduce cross-contamination between the first and second gases.

Allowable Subject Matter

7. Claims 26 and 35 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. McMillin et al. shows a single gas source with two independent gas lines and corresponding valves, but does not provide for more than two independent gas lines on the same source as required by claims 26 and 35.

8. Claims 36-39 are allowed. McMillin et al. shows a similar apparatus and allows for a sequential delivery of gas pulses, but does not provide motivation for the sequence presented in claims 36-39 for switching one valve off before opening the other.

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Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kelly Stouffer whose telephone number is (571) 272-2668. The examiner can normally be reached on Monday - Thursday 7:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Kelly Stouffer
Examiner
Art Unit 1762

kms


TIMOTHY MEEKS
SUPERVISORY PATENT EXAMINER